BIOPRO-Sim: A benchmark simulation model for bio-manufacturing processes

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BIOPRO-Sim: A benchmark simulation model for bio-manufacturing processes

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In this work, a bio-pharmaceutical production process of an API, lovastatin, is developed through a systematic process synthesis and design approach, and then modelled, implemented and simulated. In course of model implementation the experience from the real world processes from BIOPRO project is brought into the context. BIOPRO is a large Danish academia-industry cluster to foster process improvement for bio-manufacturing process (www.biopro.nu). The developed simulation is intended to be used as benchmark process model as it captures the generic process dynamics of a bio-pharmaceutical process, and as such it is well-suited to use as a test problem to evaluate different processing scenarios, optimization approaches and control strategies in presence of uncertainty. The synthesis and design of the process model is realized through a methodology based on two complimentary steps that can be applied individually or in conjunction, and is adopted to synthesize the upstream and downstream processing pathway. As such, the process model can be operated either as a whole, or as an individual upstream or downstream process.